PART III

The End of the Decade and The Golden Anniversary Celebration

The activities of the AFEB continue. Some diseases have been conquered or have become less significant militarily, for example, enteric diseases such as the dysenteries, rickettsia1 diseases such as the typhus fevers, and the encephalitides, as well as poliomyelitis. New diseases such as AIDS appear and raise the specter of catastrophic debilitation in both the military and the civilian populations. Other diseases such as malaria have not been conquered, only partially controlled with our current best knowledge. Pathogenic microorganisms continue to plague mankind and the best minds in military and civilian medicine will continue to combat them. The section that follows summarizes some of the military and medical problems that the Board confronted and advised upon during 1989.

Streptococcal Infections

Beginning in 1983 and peaking during 1987 and 1988, the Army Medical Service and the Department of the Navy reported a significant increase in streptococcal pharyngitis, particularly among recruits. Approximately one percent of those patient shown to have pharyngitis developed acute rheumatic fever. No obvious cases of streptococcal-induced pharyngitis occurred among Air Force personnel during this time, and there were also no cases of acute rheumatic fever. The prompt use of penicillin, or Erythromycin in those persons with a history of penicillin sensitivity, led to a sharp decrease in the incidence of streptococcal pharyngitis and its sequelae in Army and Navy personnel.

The AFEB was kept informed of these developments; the problem was discussed in considerable detail at the meeting of the Subcommittee on Infections at WRAIR on 16 February 1989. The three **recommendations** that the Board formulated on penicillin prophylaxis for streptococcal diseases, which were effectively applied, were that:

> 1. A selective streptococcal monitoring program should be continued at each Navy, Marine Corps, and Army recruit facility.
> 2. Chemoprophylaxis options should be tailored to the specific areas with the options to include *(a)* continued year-round programs [in populations] with high rates, such as in the Marine Corps recruits or when data suggest Bicillin is warranted, i.e., an incidence of infection of 10 per 1,000 per week, or more, of clinically confirmed streptococcal infections; *(b)* seasonal administration from October to April if monitoring data suggest a low summer rate; and *(c)* no prophylaxis if rates have historically been low throughout the year.

> *3.* Studies should be undertaken in areas with high rates, such as Marine Corps recruit depots, to *(a)* examine the desirability of administering a second dose of Bicillin four weeks after the first to prevent a second peak of streptococcal illness during recruit training; and *(b)* determine the occurrence of streptococcal skin infections, particularly in the summer months, as a justification for Bicillin prophylaxis.

Hepatitis Vaccines

The Board has been identified with the development and use of hepatitis vaccines for several decades. Hepatitis is a serious military medical problem with significant morbidity and loss of time from work. (The problem had become quite apparent in 1986, with a high incidence of hepatitis among military personnel stationed in Korea.) Discussions among the members of the Subcommittee on Infections and the military's Preventive Medicine Officers made it apparent that immunization of the entire military force against hepatitis B infection was advisable. Because of significant fiscal constraints, however, such a program was not feasible. A regimen other than the standard subcutaneous injection of vaccine, such as the intradermal route, was suggested as a way to reduce the costs and still provide appropriate protection. Screening trials were conducted using a two-dose intradermal injection of 0.1 ml vaccine. When it became apparent that adequate antibody protection resulted, recommendations were made for all military personnel assigned to Korea and other areas of high incidence to be so immunized. The conventional full-dose regimens were recommended whenever they were feasible.

The **AFEB** also recommended, in **a separate** action, that hepatitis B vaccine **be** administered to all health-care workers and to inmate personnel in U.S. disciplinary barracks.

During its meeting of 28–29 September 1989, the AFEB responded to questions relating to reduced-dose regimens for recombinant hepatitis vaccines. Recombinant hepatitis vaccines are not generic, and reduced doses of hepatitis B vaccines prepared by different manufacturers may or may not be equally immunogenic. Studies by various investigators had revealed that one-fourth (2.5mcg) to one-half (5mcg) of the currently recommended 10 mcg doses of Merck, Sharp and Dohme's recombinant vaccine (Recombivax-HB) are highly immunogenic for adults up to the age of 30. **As** of this date, reduced-dose data of the Smith, Kline, Beecham vaccine (Engerix B) are not available. Accordingly, the AFEB **recommended:**

> that a reduced dose of 5 mcg of the Merck Recombivax-HB vaccine may be used for the immunization of adults up to the age of **30.** The recommended dose of Energix B should be 20 mcg until studies indicate that **a** reduced dose is immunogenic and effective.

During these discussions, the Board leaned heavily on Dr. Saul Krugman for advice and guidance. His broad and authoritative experience in the fields of hepatitis and its control by hepatitis vaccines has made him an important resource, not only for the Board, but also for the nation.

A Problem with the Jet Injector Gun

During a Board meeting in June 1986, Captain Michael Stek, Jr., MC, USN, presented data and press clippings that suggested that a contaminated jet injector gun, which had been used at a private clinic in California in 1985, was responsible for causing hepatitis in sixty-four patients. The possibility was also raised that HIV infection might be transmitted by the jet gun when biological products, such as gamma globulin, were administered. After numerous meetings, the Board **recommended,** in March 1988,

> that the jet injector gun be used only with authorized military technical parts and that it be sterilized according to standard procedures.

SAUL KRUGMAN, M.D.

A 1939 graduate of the Medical College of Virginia, Saul trained in pediatrics at Bellevue Hospital in New York, and received his research training there under an NIH fellowship. In 1960 he was appointed Chairman of the Department of Pediatrics at New York University School of Medicine, and he directed the pediatric service at Bellevue Hospital. Saul Krugman is one of this country's most distinguished research pediatricians, and he is one of our foremost authorities on hepatitis.

The AFEB and its Commissions on Virus Diseases and Hepatitis have profited from his advice. He has been one of the AFEB's most faithful contributors. His comments are concise and, if the information desired is unavailable, he takes or suggests the steps needed to find the answer. He is scholarly and gracious, and the AFEB is in his debt.

Furthermore, the Board stated that thechanceof transmitting HIV infection through gamma globulin given by jet injector was too remote to be significant. Those persons most responsible for formulating these decisions and recommendations had previously had extensive experience with the jet injector; Dr. Abram Benenson had worked with it since it was developed.

Continuing Recommendations on Malaria

During the September 1986 meeting of the Board, and during subsequent meetings of the Disease Control Subcommittee and the Board, the problem of malaria was always discussed. In view of the complexity of the problem, the Board recommended that military medical research on malaria concentrate on two major research areas: *(a)* the search for effective drugs forchemoprophylaxis and treatment, and *(b)* the development of effective vaccines.

At the request of the Department of Defense's Office of Health Affairs, the Board studied malaria-research programs currently underway in both the military and civilian sectors, and determined that the military malaria-research programs were appropriately integrated with other federally sponsored programs. There had been, for awhile, the appearance that the efforts were not appropriately coordinated. It became clear that the United States Agency for International Development (USAID) and the military groups had somewhat differing objectives, and thus were not in conflict. The search for an effective vaccine continues and is greatly needed.

At the request of the Army Surgeon General, the **AFEB** considered the matter of Mefloquine prophylaxis during its 28–29 September 1989 meetings. The questions posed to the Board related to *(a)* confusion that might arise from a complicated prophylaxis schedule, and *(b)* the potential side effects such as dizziness and psychotic behavior that might occur in patients taking the medication. The Subcommittee on Disease Control discussed the problem in considerable detail and was aided by Dr. Hans O. Lobell of the Centers for Disease Control and other expert consultants. Based on expert consideration of the relevant data, the AFEB recommended that:

> Mefloquine should be used for the prevention of malaria in doses of 250 mg, with the first dose given immediately prior to deployment, then weekly continuously during exposure and for three weeks thereafter. Standard terminal prophylaxis for P. *vivax* and *P. ovale* should be given, when indicated. The need for a loading dose of Mefloquine requires further evaluation and is not recommended at this time. The Board recommends Mefloquine or Doxycycline use in military personnel deployed to areas of Chloroquine-resistant *P. falciparum* malaria until toxicity reactions are clarified definitively.

In addition, the AFEB made the following recommendations regarding the use of Mefloquine for military personnel in flight status:

> Flight personnel should be exempted from the use of Mefloquine until adverse neurologic and physiologic effects are studied using the above dosage regimen and are found to be insignificant. Should these results prove unacceptable from the standpoint of military effectiveness, including the function of flight personnel, further research will be required to determine minimal effective dosage regimens and blood levels necessary for prevention of P. *falciparum* infection in susceptible adults.

The Encephalitides

Japanese B Encephalitis. In 1986, a U.S. Air Force general stationed in the Far East became ill with Japanese B encephalitis. Better control measures, particularly with the use of vaccines, promptly attracted attention. The potential for Japanese B encephalitis applied particularly to those military

Armed Forces Epidemiological Board and Committee Directors
25–26 February 1988

Left to right: Frank B. Engley, Jr., Ph.D.; Samuel D. Thompson, Ph.D.; Richard D. Remington, Ph.D.; Ronald C. Shank, Ph.D.; William R. Harlan, M.D.; **and** Colonel Robert A. Wells, Ph.D., MSC, **USA,** Executive Secretary.

Left to right: Walter R. Dowdlc, Ph.D.; William S. Jordan, Jr., M.D.; Abram S. Bensenson, M.D.; Theodore E. Woodward, M.D., President of the Board; Frank M. Townsend, M.D.; and Leonard T. Kurland, M.D.

Armed Forces Epidemiological Board and Committee Directors
February 1989

Seated, left *to* right: Dr. Carol J. Johns; Dr. Abram S. Benenson; Dr. William E. Mayer, Assistant Secretary of Defense for Health **Affairs;** Dr. Theodore E. Woodward, President **of** the Board, and Dr. William E. Jordan, Jr.

Standing, left to right: Dr. John Doull; Dr. Frank B. Engley, Jr.; Dr. Richard B. Hornick; Dr. Scott B. Halstead; Colonel Robert **A.** Wells, MSC, USA, **Executive** Secretary of **the** Board; **Dr.** Frank M. Townsend; Dr. William R. Harlan; Dr. Norton **Nelson;** Dr. Llewellyn J. Legters; and Dr. Leonard **T.** Kurland.

personnel stationed in Korea, Thailand, the Philippines, and China.

Inactivated vaccines used extensively by the Japanese were reputed to cause minimal side reactions and to have a protective efficacy rate of 90 to 95 percent. Attenuated Japanese B vaccines had been under development in Japan for a number of years, although the degree of protection and the potential for vaccine virus conversion were not fully known. In 1986 and in subsequent years, the Subcommittee on Infections and the Board concluded that both inactivated and attenuated Japanese B vaccines should be used selectively, as determined by local command decisions. Military scientists were advised to continue trying to work out the details until more reliable data became available.

California Virus Encephalitis. In April, 1987, the Board was apprised of the prevalence of California virus (LaCross) encephalitis (CVE), which occurs in the mid-United States. Other forms of arthropod-borne encephalitis (arbor viruses) are western and eastern equine encephalitides and St. Louis encephalitis. Chikungunya, dengue, and yellow fever are related viral illnesses that differ in their clinical expressions.

Dr. Thomas Monath, a very capable entomologist from the Arbor Virus Center in Denver, reported on the importance and prevalence of *Aedes albopictus,* a good transmitter of CVE. This mosquito is found in about twelve states, including Mississippi, Alabama, Louisiana, Texas, Illinois, Florida, and California. *A. albopictus* transmits CVE horizontally and transovarially more avidly than does A. *aegypti.* This mosquito was apparently imported into the United States via old tires acquired from various parts of the world, particularly the Far East. Approximately 16 percent of such tires hold water that is contaminated with either ova or larvae of ***A.*** *albopictus.* Viable ova in tires can be inactivated with methyl bromide gas fumigation, but the most cost-effective method to inactivate the ova is to heat the tires to 100° C. The reason that the old tires were imported into the United States was never elucidated.

A Historical Footnote. An attenuated Venezuelan equine encephalitis vaccine that was developed at USAMRIID under AFEB and the Commission of Epidemiological Survey sponsorship was used in a massive field control program in Central America, Mexico, and Texas in 1971. The vaccine stopped an eipzootic of encephalitis. This epidemic, if uncontrolled, not only would have destroyed much of the horse population in the United States but also would have infected large numbers of humans.

Board Briefing on Lyme Disease

At its meeting on *25* February **1988,** Major (P) Donald Driggers, MSC, USA, and Commander David Trump, MC, USN, briefed the AFEB on Lyme disease. This affliction is potentially of massive importance to both the military and the public in many areas of the continental United States. Many epidemiologists believe that, were it not for the advent of AIDS, Lyme disease would now be the nation's primary infectious disease problem. Incidence of the disease is steadily rising in the United States, more commonly among males, and with widespread distribution. Rodents and deer are the favorite hosts of the tick vector, Ixodes *dammini.* Birds may be responsible for the widespread distribution of the infected ticks. Central nervous system signs are often early manifestations of this infectious disease, and troublesome arthritis is a common late sign. The need for early specific treatment was emphasized. Due to the extreme importance of this disease, the Board will continue to monitor progress and events in this area.

Continuing Recommendations on Human Immunodeficiency Virus

On 20 September 1989, the Surgeon General of the Army requested that the AFEB discuss Zidovudine (AZT) and make recommendations regarding its use in the armed forces. In particular, the Surgeon General asked that the Board consider **AZT** as it is used to treat patients in the early stages of Human Immunodeficiency Virus (HIV) infections, both now and in the immediate future.

At its 28–29 September 1989 meeting, the AFEB considered in some detail the issue of **AZT** chemotherapy in military patients infected with HIV-l. The Board's experts presented the current knowledge. AZT is an expensive drug that, according to the limited information available, may prolong the lives of patients with AIDS But the drug may also be associated with additional problems, such as developing resistance to AZT and other drugs or developing other adverse effects from long-term usage.

The use of AZT signals the advent of antiviral chemotherapy for this deadly infection. When the Food and Drug Administration (FDA) approved its use in the treatment of certain patients with AIDS, some in the medical profession were prompted to adopt this drug as the standard of care. The FDA gave its approval based on significantly different outcomes of 281 patients. Currently, no subsequent promising studies with confirmatory data have been released or published. By virtue of the unavailability of complete data, the Board made the following statement:

> Currently the AFEB cannot make any specific recommendations regarding the appropriate therapeutic or prophylactic use of AZT. The Board recognizes that publication of the pertinent studies, as well as a National Institute of Allergy and Infectious Disease (NIAID)-sponsored consensus conference and other meetings, will occur shortly. At that time, assessment of the effect of varying doses of AZT on therapeutic effectiveness and associated toxicity will be available. Credible answers to questions raised by the military can then be formulated.

In its deliberations, the Board recognized that a few strains of HIV-1 that are resistant to AZT have been isolated, and that this resistance appears to develop when the drug is administered over long periods of time. Furthermore, the virus's drug-resistance appears to cross over to other promising experimental drugs. Hence, the AFEB **recommended** that:

> Because of the potentially adverse influence of resistance on the efficacy of AZT, this effect needs prompt additional clinical and in *vitro* study. The military anti-HIV drug testing program is an excellent resource to assess the significance of this resistance on the future use of AZT and other drugs.

The AFEB further noted the implementation of the so-called "parallel track" program for drug evaluation, wherein control preparations are omitted from studies on medications of potential use in the treatment of patients infected with HIV-I. The Board was deeply concerned that this development might make it difficult to assess newer drugs that might be effective. The Board therefore **recommended** that:

> carefully designed studies on potential antiviral drugs be conducted by the military, in addition to other establishments within the scientific community.

Important scientific contributions of the WRAIR group that included Lt. Colonel John Brundage, Lt. Colonel Robert Redfield, Colonel Edmund Tramont, and Colonel Donald Burke assisted the Board in fulfilling its advisory role on HIV-control in the military. They developed clinical and epidemiological data on HIV infections, formulated a helpful clinical classification based on the stages of the illness, and sharpened the laboratory diagnostic procedures.

Military Readiness Issues Related To Worldwide Deployment

In March of 1984, Dr. William Mayer, the Assistant Secretary of Defense for Health Affairs, had requested that the AFEB evaluate the current worldwide reporting systems of epidemiological data, with reference to the prevalence of diseases and their incidence. The Board was asked to direct its attention to the epidemiological information relating to potential trouble-areas of the world and to comment about

those preventive measures best suited to insuring preventive control measures. (The complete report of the ad hoc Committee, chaired by Dr. Paul Densen, that addressed these problems is found on pages 211–220.

One of the Board's important recommendations pertaining to the medical problems of rapid deployment was that a physician-epidemiologist be appointed and assigned to the Armed Forces Medical Intelligence Center (AFMIC) at Fort Detrick, whose major responsibilities would be to *(a)* designate the diseases prevalent in a country, *(b)* rank them in order of their military importance, and *(c)* list the preventive measures necessary to deal with them.

The Board periodically addressed these important issues, but fiscal and other constraints caused some delays. In the interim, Colonel Robert Wells, the Board's Executive Secretary, and I visited AFMIC at Fort Detrick. At this meeting, during the fall of 1988, the Boards views and wishes in terms of the desired objectives were discussed. As a consequence of that preliminary discussion, during the February 1989 meeting of the Board, Lt. Colonel H. Jack Baghdassarian, MC, USAF, gave an objective and complete report directly rclatcd to thc aforcmcntioncd subjcct. In his report, Colonel Baghdassarian detailed the important epidemiological diseases country by country. The report described the topography, climate, water sources, animal threats, prevalent arthropods, plant threats, hospital and other medical-treatment sites, location of major air fields, and included a complete listing and description of the diseases of operational importance. His exhaustive document represented a resource of considerable importance; the Board unanimously recommended its adoption. The following description of Kuwait is excerpted from Colonel Baghdassarian's excellent report:

KUWAIT

Location

Continent: NE Arabian Peninsula.

Borders: NW, N-Iraq, E-Persian Gulf, S,SW-Saudi Arabia

Capital: Kuwait City (2920N 4800E).

Major Cities: Hawalli (2917N 4800E); Mina Al Ahmadi (2900N 4800E); Al Jahrah (2920N 4749E); Khawr al Mufattah (2921N 4755E); Al Shuaybah (2903N 4808E).

Local Time: ZULU **+3,** EST +8

Topography

General: 99% hot arid desert land, **1%** cultivated land.

Subregions: Largely desert with small rolling hills, Kuwait Bay and urban/port concentrations along the Eastern border.

Major Features: Kuwait is located on a gradually sloping plain which rises westward from the Persian Gulf and reaches a maximum elevation of 951 ft at the extreme western border. The country consists primarily of sandy, riverless desert with some **oases** and a **few** fertile patches. Although 90% of Kuwait's roads are paved, there are few major roads in the western desert area of the country. Kuwait Bay extends approximately 30 miles inland from the Persian Gulf on the central eastern border. The Jal az-Zawr escarpment, reaching elevations of 475 ft, extends along the northwestern shore of Kuwait Bay. A natural harbor and the capital city of Kuwait are located on the southern shore of the Bay and urban/port concentrations extend southward along Kuwait's eastern border.

Climate

General: Essentially hot, desert climate with minimum rainfall. Summer precipitation is nearly non-existent and temperatures often reach 125"F and occasionally go as high as 165° F. Kuwait's annual 4 inches of precipitation occurs almost exclusively in the winter and, even in the coolest months, temperatures are comfortable averaging nearly 60° F.

Seasonal: Sand and dust storms **occur** throughout the year, **but are** especially common from March through August.

Climatic Brief: Kuwait International Airport (prepared 12 May 1980). [NOTE: Colonel Baghdassarian's report contained a detailed weather chart here, which I have omitted. *T.E.W.*]

Water Supply

Sources: There are no permanent water sources in the country. Desalinated, chlorinated sea water is the principal watersource **for** populated areas. Outlying areas rely ondesertwells, waterholes and intermittent surface water sources. These supplies are generally contaminated.

Potability* and *Treatment: The municipal water supply in Kuwait City **is** generally considered safe fordrinking, but bottled water is still recommended for consumption. In all other parts of the country, *only* bottled or treated water should be consumed.

Electricity

[Current]

AC 50, V 240/415

Adapters

Plugs: Type C,D & G

Animal Threats

[NOTE: Colonel Baghdassarian's report contained tables of antivenin sources for and illustrations of animal and plant threats in Kuwait, which I have omitted. *T.E.W.*]

Snakes

Sea Snakes (Hydrophidae): *Hydrophis spp. Lapemis curius, Pelamis platurus, Thalassophis viparinus*
Desert Black Snake (Elapidae): *Walterinnesia aegyptia,*
Vipers (Viperidae): *Cerastes cerastes gassperettii, Echis carinaatus pyramidium, Pseudocerastes persicus persiccus*

Marine Invertebrates

Sea urchins,cones, nettles, octopuses, Portuguese man-of-war, and sea wasps (box jellyfish), inhabit the coastal waters of Kuwait. Their venomous stings, toxic bites and/or contact irritants pose a potentially serious threat to unprotected personnel.

Arthropods

Blister Beetles: *(Cylindrothrox spp., Mylabris tenelrosa)*
Centipedes: *(Scolopendra spp., Scolopocryptops spp., Otostigmus spp.)*
Scorpions: *(Leiurus quinquestraiatus, Androctonus crassicauda)*
Spiders: (*Latrodectus spp.,* Black Widow)

Plant Threats

Ingested plant parts of the commonly occurring jimson weed, juniper, lantana, castor bean, night shade, oleander, or poppy can seriously debilitate personnel and, in severe poisonings, maybe fatal. There are no contact vesicant plants which pose a major threat in Kuwait.

Immunizations

WHO Recommendations: No vaccination requirements for any international traveler.
Military Requirements: Routine immunizations.
Note: State Department recommends gamma globulin.
HIV-Screening Requirements. The Kuwaiti government requires proof of negative AIDS testing from individuals applying for resident visas. Results of tests performed in the United States are accepted.

Additional Information **of** Operational Importance

The extreme heat in Kuwait will degrade unprotected medical supplies. Tablet, rather than capsule, medications are recommended. All personal medications should be officially labeled and no alcoholic beverages should be included with personal effects.

MEDICAL TREATMENT AND **EVACUATION INFORMATION**

Kuwaiti Hospitals **in** Kuwait **City** (2920N 4800E)

Ibn Sina and ***Al Sabah Hospital Complex*** (800+ beds) major referral center, ambulance service, helipad, 76-bed

burn care unit is scheduled for completion in Sep 1988, tel # 81200.
Mubarak Hospital (544 beds) most specialty services, ambulance service, tel #312725.
Amiri Hospital (400+ beds) general care facility, some specialty services, ambulance service, tel # 447589.

U.S. Medical Facilities: None identified.
U.S. Embassy: Bneid al-Gar, Kuwait (opposite the Hilton Hotel), tel #2424150-9
mailing address: P.O. Box 77 Safat, Kuwait, State of Kuwait
message address: 22039 HILTELS "Pass to American Embassy"

Major Airfields
Kuwait International (2913N 4758E) L-11152, W-150, joint military-civilian control, suitable for all aircraft.
Ahmed Al Jaber AB (2856N 4747E) L-10000, W-140, military control, daylight, visual operations only, suitable for C-130, C-141B
JMRO: Rhein-Main AFB, Germany / AV #330-1110, X7426/7 COMM # 011-49-69-999-1, X 7426/7.

KUWAIT EPIDEMIOLOGY: DISEASES **OF** OPERATIONAL IMPORTANCE

Short-term Incubation Periods **(Usually Less Than 15 Days)**
Acute non-specific diarrhea (12 hours to 4 weeks)
General: Endemic. Occurs year-round.
Potential Agents: *Entamoeba histolytica, Salmonella* spy., *Shigella* spy., and enterotoxigenic *Escherichia coli* (resistant to ampicillin, sulphonamide and trimethoprim/sulphamethoxazole).
Transmission: Fecal contamination of food, water or fomites.
Prevention: Proper sanitation measures.
Cholera (usually 2 to 3 days, range of a few hours to 5 days)
General: Not endemic, but sporadic outbreaks occur in immigrant populations during late summer months. 113 imported cases in 1985, 38 in 1986.
Agent: *Vibrio cholerae.*
Transmission: Fecal contamination of water or food contaminated by dirty water, feces, soiled hands or flies.
Prevention: Standard sanitation measures.
Crimean-Congo hemorrhagic fever (CCHF) (3 to 12 days)
General Virus has been isolated from Kuwaiti Bedouins who commonly cross into bordering countries which have reported CCHF.
Agent: Crimean-Congo Hemorrhagic Fever Virus, a Nairovirus.
Transmission: Bite of an infective adult *Hyalomma spp.* tick.
Prevention: Avoidance of tick-infested areas and animal hosts. Frequent tick inspections and proper removal techniques. Tick repellents.
Dengue (usually 5 to 6 days, range of 3 to 15 days)
General: May be present in the Persian Gulf area, but current incidence and distribution data not available.
Agent: Dengue virus, types 1-4, Flaviviruses.
Transmission: Bite of an infective *Aedes spp.* mosquito.
Prevention: Proper sanitation measures and vector control. Insecticides, insect repellents, and bed nets.
Malaria (12 days)
General: Not indigenous but potential vectors are present. About 500 imported cases occur annually.
Agent: *Plasmodium spp.*
Transmission: Bite of infective female anopheline mosquito.
Prevention: Proper sanitation measures and vector control. Insecticides and insect repellents. Suppressive drugs.
Sand* Fly *Fever (usually 3 to 4 days, range of 3 to 6 days)
General: Known vector, *Phelbotomus papatasi,* is present, but incidence data from Kuwait not available. Disease is reported from bordering countries.

Agent: Sandfly fever group of viruses, Pleboviruses.
Transmission: Bite of an infective sandfly.
Prevention: Avoidance of sandfly-infested areas. Destruction of animal hosts. Insecticides and insect repellents.

Typhoid and Paratyphoid (1 to 3 weeks)
General: Cases occur, about 200 annually.
Agent: *Salmonella typhi,* S. *paratyphi.*
Transmission: Fecal contamination of water or food (especially shellfish, dairy products) contaminated with causative agent(s).
Prevention: Proper sanitation measures.

Viral Hepatitis (15 to 50 days, average 28 to 30 days)
General: Hepatitis A is highly endemic. A 1985 survey showed 98% of the native population over 20 was serologically positive, indicating childhood acquisition of the disease.
Agent: Hepatitis A virus.
Transmission: Person to person or the fecal oral route.
Prevention: Proper sanitation measures and personal hygiene. Prophylactic doses of gamma globulin.

Long-term Incubation (Usually More Than 15 Days)

Leishmaniasis (week to many months)
General: Small, but increasing number of cutaneous cases reported. Known vector, *Phlebotomus papatasi,* is present, but no zoonotic reservoir has been identified. The disease may not be endemic.
Agent: Leishmania tropica, Le. major, Le. aethiopica.
Transmission: From the zoonotic reservoir through the bite of infective female phlehotomines (sandflies).
Prevention: Elimination of sandfly breeding sites. Residual insecticides. Destruction of animal reservoirs.

Schistosomiasis (2 to 6 weeks)
General: Not currently reported in Kuwait, but S. *haematobium* is highly endemic in the Tigris and Euprates waterways of neighboring Iraq.
Agent: *Schistosoma mansoni, S. haematobium.*
Transmission: Free swimming larvae penetrate human skin immersed in contaminated fresh water sources.
Prevention: Prevent exposure to contaminated water. Vigorous towel drying followed by applications of 70% alcohol to skin surfaces wet with suspected water. Reduction of snail habitats and use of molluscicides on snail breeding sites.

Additional Epidemiological Notes

Sexually transmitted diseases
Gonorrhea and syphilis occur, but incidence data are not available.
Penicillin-resistant gonorrhea (PPNG) has been reported.
One case of AIDS had officially been reported as of 31 May 1988.

Rabies
Keported to be endemic in Kuwait; reservoirs include cats, dogs, wolves, and jackals

Helminthic infections
Intestinal helminths, especially ascarids (transmitted by ingestion of eggs on soil-contaminated foods), are widespread.

Brucellosis
Widespread throughout the Middle East, has been increasing in incidence in Kuwait where the consumption of fresh milk accounts for most infections.

AFEB Support of the Medical Follow-Up Agency

The Board met at Parson's Island, Maryland on 28–29 September 1989. The following agenda shows the topics discussed, together with the participants, and provides a glimpse at the wide scope of Board concerns:

AGENDA

ARMED FORCES EPIDEMIOLOGICAL BOARD
PARSON'S ISLAND, MARYLAND

Theodore E. Woodward, *M.D.*
President, AFEB

William S. Jordan, Jr., M.D.
Acting Chairman, Disease Control Subcommittee

Thursday, 28 September 1989

0825–0830	Opening **Remarks** *Dr. T. E. Woodward, Col.* R. *Wells*
0830–0930	Army Question: Hepatitis B Vaccine *Col. E. Takafugi, Dr. West, Dr. Boscia, Dr. Krugman*
0930–1015	Antimalarial Drug Research Overview *Col. Milhous*
1015–1115	Army Question: Mefloquine *Col. Takafugi, Cmdr. Oberst, Dr. Schuster, Dr. Lobel*
1115–1130	Food-Borne Outbreak Update *Lt. Col. Warner*
1130–1200	Team Spirit Exercise *Lt. Cmdr. Hanson, Maj. Sanchez*
1200–1300	Lunch
1300–1400	Preventive Medicine Officer Reports *Col. Erdtmann, Capt. Bina, Lt. Col. Wright, Cmdr. Makela*
1400—IS00	Status Report: HIV in the Armed Forces *Col. Erdtmann, Capt. Bina, Lt Col. Wright, Cmdr Makela*
1500–1615	Army Question: Zidovudine (AZT) Use *Col. Burke, Col. Oster, Cmdr. Mayers*
1615–1630	Streptococcus Update *Lt. Cmdr.* Gray

Friday, 29 September 1989

0800–0845	Medical Follow-up Agency *Dr. Robinette and Dr. Page*
08454930	Pest Management Board *Col. Clegern*
0930–1015	Theater Army Medical Management Information System (TAMMIS) *Maj. Fletcher* Status Report on Influenza Vaccine *Dr. Jordan*
1015–1045	Executive Session
1045–1200	Brunch and Departure

One of the most important agenda items for this meeting was a discussion of the activities of the Medical Follow-up Agency of the Institute of Medicine of the National Academy of Sciences. Throughout the past several decades, the AFEB has emphasized the need for a longitudinal, long-term, follow-up system that would provide continuing information relating to current health-care practices, not only for the treatment of the individual patient but also to provide information on changing trends and practices in the various fields of medicine. The ensuing comprehensive discussion at this meeting of the Board led to the following memorandum, which was transmitted on 3 November 1989, and follows;

MEMORANDUM FOR
The Assistant Secretary of Defense for Health Affairs
The Surgeon General, Department of the Army
The Surgeon General, Department of the Navy
The Surgeon General, Department of the Air Force
The Honorable Alan Cranston, Chairman, United States Senate Committee on Veterans Affairs

SUBJECT: Support for the Medical Follow-up Agency of the National Academy of Sciences

1. Throughout its distinguished history, the Medical Follow-up Agency (MFUA) has served the Armed Forces by providing critical medical data of eminent practical importance. This information has been essential not only to the military, but has also served the long-term interests of the civilian health care community as well. This agency is, in fact, a national resource which ultimately impacts on both our defense posture and the well-being of every American.

2. Due to the realities of an ever-shrinking Federal budget, the existence of this key organization is now threatened. Through a Congressional mandate last year, a panel, under the auspices of the Office of Technology Assessment evaluated the status of the MFUA. As a result of the panel's recommendations, the agency is to be continued for a five-year period with a budget of $0.5 million per year in core support — providing that these funds will, in fact, be available. It is ironic that there may be difficulty in funding this relatively small amount for an organization that has done so much good over the years. In the words of the Office of Technological Assessment (OTA) working group, "There is a little dispute that the MFUA is the clear choice for studying long-term-effects of military experiences (whether war-associated or incidental)."

3. The facts speak for themselves. The resources of the MFUA provide essential information to many long-term studies of major importance. For example, the National Heart, Lung, and Blood Institute (NHLBI) of the NIH collaborated with this agency in establishing twin registries for WWII and Vietnam veterans. These data have been utilized on multiple occasions and have yielded scientific data on the genetic relationships of cardiovascular diseases and pertinent risk factors. There are many other examples which could be readily referenced, describing work by the MFUA on coronary disease, cancer and stress, and related epidemiological studies which impact on the well-being of us all.

4. At its recent meeting, the Armed Forces Epidemiological Board (AFEB) and its panel of experts devoted considerable time to discussing the contributions of the Medical Follow-up Agency and the relevance of the information to the military as well as *to* the public. The Board was unanimous in its strong recommendation that funds must be committed to keep this agency viable. The AFEB, therefore, strongly encourages ongoing support for the continued funding of the MFUA. It is imperative that collaborative studies with this organization be expanded so that there be a continuum in the utilization of this key medical information on into the future.

FOR THE ARMED FORCES EPIDEMIOLOGICAL BOARD

Theodore E. Woodward, M.D.
President, AFEB

Robert A. Wells, Ph.D.
Colonel, USA, MSC
Executive Secretary

The Fiftieth Anniversary

The AFEB held its winter meeting in February 1990 at WRAIR. Because of the publication deadlines for this volume, it was not possible to include details of the meeting. It is fitting, however, to close with the agenda for the Fiftieth Anniversary Celebration of the Board, to be held at WRAIR on 28 June 1990. That agenda (tentative) follows:

Armed Forces Epidemiological Board
Golden Anniversary Celebration
28 June 1990

Theodore E. Woodward, M.D. Presiding

1200	Reception and Luncheon in the Armed Forces Institute of Pathology Museum
1300	The Army Band
1315	Presentation of the Colors National Anthem Invocation: Chaplain, Walter Reed Army Medical Center
	Welcome: *Maj. General Philip K. Russell, MC, U.S.* Army, Commander, Medical Research and Development Command
	Introductions of Invited Guests
	The Honorable George H. W. Bush, President of the United States *The Honorable Dick Cheney,* Secretary of Defense *The Honorable Michael* P. W. Stone, Secretary of the Army *Lt.* General *Frank* F. *Ledford, Jr., MC,* Surgeon General of the Army *Vice Admiral James A. Zimble, MC,* Surgeon General of the Navy *Lt. General Monte B. Miller, MC,* Surgeon General of the Air Force *Maj. General* Robert *H. Buker, MC,* Deputy Surgeon General of the Army
	Introductions of Past Presidents of the AFEB
	Gustave J. Dammin, M.D., 1960–1972 *Edwiti H. Lmnette, M.D., Ph.D.,* 1972–1976 *Herschel E. Griffin, M.D.,* 1978–1980 *Theodore E. Woodward, M.D.,* 1976–78; 1980–1990
	Presentation of AFEB History to Invited Guests
1430	Recess and Coffee
1500	Call to Order by the President of the AFEB: Theodore *E. Woodward, M.D.* Report of the Executive Secretary: Colonel *Robert A. Wells, Ph.D., MSC, U.S. Army*
	Greetings *Enrique Mendez,* Assistant Secretary of Defense for Health Affairs Lt. *General Frank* F. Ledford, *Jr.,* MC, Surgeon General of the Army *Vice Admiral James A. Zimble, MC,* Surgeon General of the Navy *Lt. General Monte B.* Miller, *MC,* Surgeon General of the Air Force *Maj. General Richard* D. *Cameron,* MC, Commanding General Walter Reed Army Medical Center
1545	The Future of the AFEB *Paul M. Densen, D.Sc.*
1600	The Joseph E. Smadel Lectures *William* S. Jordan, *Jr., M.D* *William* D. *Tigertt, M.D.*
1700	Adjournment
1900	Formal Reception and Dinner, Navy Officers Mess, Bethesda

UNPAID DEBTS

by

Theodore E. Woodward, M.D.
President, Armed Forces Epidemiological Board

Text of a talk delivered on the occasion of the Fiftieth Anniversary of the AFEB

Walter Reed Army Institute of Research, Washington, D.C.
Sternberg Auditorium
28 June 1990

The strength of any enterprise, whether a business, a corporation, a medical center, or a scientific institution, is not its buildings, its plush surroundings, or its modern laboratories. Rather, it is the people who work within its walls. Perhaps more than anything else, this is why the AFEB, with its system of Commissions and advisory Committees, has been so successful. The founders built the AFEB on rock by selecting and recruiting the right people to assist the military services in their mission to maintain good health among the troops. They initially conceived that all of the Board's activities would be directed toward the goals of better understanding and prevention of diseases, thereby insuring a healthy military service.

One of the important and enriching experiences in my life was the opportunity to mature and develop during the five years I spent in the military. After World War II, there was an even greater chance for intellectual growth through the privilege of participating in the scientific activities of several Commissions of the Board, and later with the Board itself.

This is not the time to review the many activities of the Board and its Commissions; those remarkable events are now a matter of historical record. A history of the AFEB's first fifty years is now available and is presented in book form today. Individual Commission reports are also in preparation by directors of those Commissions, and some are nearly at the printing stage. This prompts me to thank wholeheartedly those who undertook the important task of writing and recording these activities of medical and historical importance. For my own part, preparation of the Board's history has been a privilege because it is a report of the accomplishments of many persons whose work is an achievement almost beyond measure. It is to those persons who contributed so much and to this organization that I feel such a sense of indebtedness.

I plan to speak in my own way for a few minutes. *So* relax, you are neither to be guided nor misguided. My favored life as a medical-school teacher, clinical observer, practitioner, and sometimes a doer, has enriched me far beyond that which I have contributed. In searching through the memories of my experiences these past fifty years, I came across a number of unpaid IOUs to several persons who, by virtue of their stature, professional example, and teaching, unwittingly allowed me to borrow from them. It is not possible to make proper repayment, but I take some solace in realizing that others, too, have borrowed heavily from those special persons. Their help to me was incalculable. Their contribution through the AFEB to the cause of epidemiology is a bright light in the history of public health. Each of you has special heroes; permit me to have mine. The persons about whom I have chosen to comment are but a small sample of a large group, all with strong roots in the health and welfare of the military services.

Stanhope Bayne-Jones set an example by the conduct of his productive life and by his insistence that a professional person should accept the responsibility for any role of benefit to society and then should complete the assignment.

My dear friend ***Joe Smadel*** taught me much about science and helped me sift out difficult medical problems. He clarified for me the importance of the bridge between the bench and the patient and showed that bench and field work, rather than armchair philosophy, were essential. When I was a young

departmental chairman, he helped me to formulate my criteria for selecting good people. Good training, teaching ability, interest in teaching, and creativity are not enough; the creative person must also have shown documented evidence of that creativity by publishing something decent and readable.

Ken Goodner, my most irascible, unpredictable, and sensitive friend, was not soft, sentimental, patronizing, or scornful of medical students. Rather, he was their friend. He encouraged young men and women to achieve their potential as fine physicians and never ceased to impart the glow of his enthusiasm, which was fed by the rich tradition of medical history, one of his constant preoccupations. He appreciated the lessons of the old masters of medicine.

Colin M. MacLeod and ***Thomas Francis, Jr.,*** themselves close friends, were leaders with versatility, wisdom, absolute insistence on scientific accuracy, and little tolerance for stupidity. Each knew so well how to properly evaluate the important characteristics of people, how to analyze important scientific issues, and how to spend public funds intelligently. To see them in action was to learn.

K. *F.* Meyer was sincerely respected by those who knew and learned from him. His ability as a field scientist, coupled with his picturesque turns of phrase, gave me, a neophyte, a clearer view of why a problem is a problem, and the route to take to find the solution.

I am indebted to ***John H.*** Dingle and there are many others who feel the same way. One of his creeds, "One must take time to design the study of a problem," he applied to his early work on acute respiratory diseases. Others of his creeds, "Utilize the natural setting when possible; don't manipulate nature's way; don't force results; have adequate data; temper your conclusions by possessing full knowledge of the earlier accomplishments of others, and acknowledge their findings and views," are important for all of us to understand and practice.

When my wartime boss ***Leon A. Fox*** had confidence in anyone, he expressed his wishes succinctly and then watched, rather than directed, as long as the issue seemed to be progressing well and heading toward its solution. He accomplished his objectives by taking action rather than by issuing memoranda. One of his basic principles was, "Know the subject or shut up," which is not a bad rule.

All one has to do is to peruse the historical data: the documents, minutes, accounts of events, and letters, to understand that the activities of these pioneers and many others shaped, and helped to shape, the military health standards and the practice of preventive medicine during World War II and thereafter. A small sample of their scientific "firsts" and contributions to the medical literature is displayed in the foyer outside this hall.

My purpose today has been to relate how a few men strove for—and achieved—excellence in their chosen fields. In so doing, they favored the AFEB and its Commissions, and they, along with others, were pillars of strength. By the conduct of their lives and their wise counsel, they enhanced our profession and inspired us. In addition to building solid foundations in the basic and clinical sciences, they provided us the opportunity to associate closely with informed professionals, a link of immeasurable value. This is what the AFEB has done for me.

It is not possible for me to measure the extent of my indebtedness to those I have named, but in no way do I exclude the many others who have helped and enriched my growth, and who are still with us today. A stanza from Kipling's "Spies March" is a fitting tribute to mark these fifty years of epidemiological science:

There are *no* leaders to lead us to honor,
and yet without leaders we sally.
Each man reporting for duty alone, out of
sight, out of reach of his fellow.
There are no bugles to call the battalions,
and yet without bugles we rally,
from the ends of the earth to the ends
of the earth, to follow the standards of yellow.